SYSTEM TEST PLAN

For
Console Replacement System (CRS)Build 10.0/Voice Improvement Processor (VIP) Build 3.1

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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Weather Service/Office of Operational Systems
Field Systems Operations Center/Test and Evaluation Branch

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Acronyms

ACP	Audio Control Panel
ASC	Audio Switch Controller
ASCII	American Standard Code for Information Interchange
ASM	Audio Switch Module
AWIPS	Advanced Weather Interactive Processing System
CAFÉ	CRS AWIPS Formatter Extended
CLI	Climate Report
CP	Central Processor
CPE	Communications and Power Engineering, Incorporated
CPU	Central Processing Unit
CRS	Console Replacement System
CSC	Computer Software Component
CTA	Call To Action
DEC	Digital Equipment Corporation
DOC	Department Of Commerce
ECR	Engineering Change Request
EO	Emergency Override
EMRS	Engineering Management Reporting System
FEP	Front End Processor
FFW	Flash Flood Warning
FIPS	Federal Information Processing Standard
FLS	Flood Stage Message Formatter
FLW	Flood Warning Message Formatter
FTP	File Transfer Protocol
GUI	Graphical User Interface
HWR	Hourly Weather Roundup
ICWF	Interactive Computer Worded Forecast
IMR	Identical Message Replacement
ITB	Integrated Test Bed
LAC	Listening Area Code
LAN	Local Area Network
LP	Line Printer
MMI	Man Machine Interface
MP	Main Processor
MRD	Message Reference Descriptor
MU	Monitor Unit
N/A	Not Applicable
NMTW	NWS Headquarters Modernization Test and Integration AWIPS, WFO System
NOAA	National Oceanic and Atmospheric Administration
NWR	NOAA Weather Radio
NWRSAME	NOAA Weather Radio Specific Area Message Encoder
NWS	National Weather Service
OAT	Operational Acceptance Test
OS	Operating System
PROM	Programmable Read Only Memory
RC	Request for Change

RCM	ROAMS Controller Module
ROAMS	Remote Off-Air Monitoring System
RVS	River Statement
SAF	State Area Forecast
SFTP	Secure File Transfer Protocol
ST	System Test
SCO	Santa Cruz Operations, Inc.
SRS	System Requirement Specification
SSO	Synthetic Speech Override
SSH	Secure Shell
SSL	Secure Socket Layer
TRG	Test Review Group
TTR	Test Trouble Report
TTS	Text-to-Speech
VIP	Voice Improvement Processor
VU	Volume Unit
WARNGEN	Warning Generation application formatter
WFO	Weather Forecast Office
WSH	Weather Service Headquarters
WWA	Warning, Watch, Advisory

1.0 Introduction

This plan describes the Government tests performed during the System Test (hereinafter referred to as "ST") intended to verify the National Oceanic and Atmospheric Administration (NOAA) Weather Radio (NWR) Console Replacement System (CRS) Build 10.0 software and Voice Improvement Processor (VIP) Build 3.1 software (hereafter referred to as the CRS B10.0/VIP B3.1 software) conforms to a set of performance standards [derived from the CRS System Requirements Specification (SRS)].

The main purpose of the CRS B10.0/VIP B3.1 software is to provide security provisions for file transport and user login processing. The software will enable secure file transport using the secure shell/secure file transfer protocol (**ssh/sftp**) for all Advanced Weather Interactive Processing System (AWIPS) to CRS and CRS to Voice Improvement Processing (VIP) system file processing. The software will also verify user logons per Department of Commerce (DOC) password compliant user logon criteria. Additionally, clear text file transfer protocol (ftp) logins between AWIPS, CRS, and VIP system will be eliminated to ensure secure transactions.

The **ssh/sftp** is a protocol suite of network connectivity tools that encrypts all traffic (including passwords) to effectively eliminate eavesdropping, connection hijacking, and other network-level attacks. Additionally, ssh provides a myriad of secure tunneling capabilities, as well as a variety of authentication methods; “ssh” suite includes the “ssh” program which replaces rlogin and telnet, and “sftp” which replaces “ftp”.

CRS B10.0/VIP B3.1 software also contains twenty-one modifications including fixes and enhancements to correct problems, and to improve CRS and the CRS/VIP interface. Some of the modifications include the handling of externally generated voice messages, VIP and manual recording fix, special “DMO” test NOAA Weather Radio Specific Area Message Encoder (NWRSAME) capability, multiple future effective time interrupt fix, and duplicate listening area code scheduling problems. While a new VIP build will not be required for the CRS Build 10.0, the VIP will be updated with security patches to support the secure transactions including appropriate scripts to handle non-clear text and other related automated installation.

The ST will be performed at the NWS Headquarters (WSH) located in Silver Spring, Maryland. Upon successfully passing the ST, the CRS B10.0/VIP B3.1 software will be shipped to selected field sites for an Operational Acceptance Test (OAT).

1.1 Test Plan Organization

This ST plan is composed of three sections. Section 1.0 contains introductory material dealing with Build 10.0 contents, test strategy, objectives, result analysis, and prerequisites.

Section 2.0 describes the schedule and methodology for conducting the ST, the facilities employed, pre- and post-test activities, and supporting documentation. This section also contains information on test personnel and their responsibilities.

Section 3.0 discusses how a recommendation for OAT will be made and how the test report will be written.

1.2 CRS B10.0/VIP B3.1 Contents

The CRS B10.0/VIP B3.1 software contains 23 modifications. The important modifications address the two security issues to provide automated compliance with all of the DOC password logon policies, and secure file transport for computer system networks. Details of these two modifications are as follow:

1) Implements the user logon code using open source routines to check for DOC password compliance with respect to number, kind of character, and password aging.

1.1 UnixWare password revision and any System Defaults Manager (SDM) login manager change.

1.2 VIP update RedHat Linux Operating System (O/S) in the Linux-Plug-Able Module (PAM) configuration for closest match in password.

2. Implements “ssh/sftp” (secure telnet and secure file transfer) between AWIPS, CRS, and VIP system.

2.1 Analysis of open secure sockets layer (openssl) and open secure shell (openssh) encryption packages to determine and remove non-open standards. Configure and confirm system still works with RedHat 7.2/7.3 “ssh”. Configure initial “ssl/ssh” build under Clearcase.

2.2 Redo the AWIPS simulator data feed system from RedHat Linux 7.12 to RedHat Linux 9.0 for AWIPS compatibility. Implement “ftp” and “sftp” file transfer security patches, and update hardware, etc.

2.3 Development of system administration procedure to configure “ssh” on the AWIPS simulator.

2.4 Development of encryption “key/ssl/ssh” installation scripts and procedures for CRS/VIP.

2.5 Eliminate the use of clear text FTP logins between AWIPS and CRS and between CRS and VIP.

2.6 Security update to “ssl” necessary to eliminate denial of service vulnerability.

The CRS B10.0/VIP B3.1 software also includes 21 fixes and enhancements to correct problems and to improve CRS and the CRS/VIP interface such as restart of CRS during VIP processing of voice recorded messages, local 10-digit dialing with the CRS/Remote Off-Air Monitoring System (ROAMS) interface problem, “DMO” Test NWRSAME capability, externally generated voice messages, etc.

The following Engineering Change Requests (ECRs) were incorporated into the CRS B10.0/VIP B3.1 software. Refer to the CRS B10.0/VIP B3.1 Release Notes (Attachment C) for details:

1. ECR 805 - **Include Configuration/logon Code For DOC Password Compliance**.
2. ECR 804 - **Elimination Of Clear Text FTP Logins Between AWIPS/CRS, and CRS/VIP**
3. ECR 786 - **Correct problems with VIP/manual recording collision, EO Streamcopy failure, and Force cp_vc time out and restart CRS so it won't keep waiting for cp_di to respond**
4. ECR 785 - **CommPower's SNQM Additional Keys and Queues**
5. ECR 214 - **Support For Externally Generated Voice Products**.
6. ECR 209 - **Date/Time Or AWIPS Time Request Updates Stop/Start CP_VC.**
7. ECR 213 - **Multiple Future Effective Time Watch/Warning Interrupts Are Not Scheduled**.
8. ECR 216 - **CRS/ROAMS Does Not Recognize Bit For 10-Digit dialing**.
9. ECR 215 - **Message Monitor Interface (MMI) Font Too Small**.
10. ECR 799 - **Add Special DMO Test NWRSAME Capability**.
11. ECR 803 - **OffLine Tone Generator Failure to Write Configuration To Disk**.
12. ECR 806 - **Security Patches For VIP (Red Hat 7.3) Operating System**.
13. ECR 807 - **VIP changes for Mondo image system**
14. ECR 811 - **VIP SFTP Changes to ftp to MPs Scripts**
15. ECR 808 - **CP_VC changes in MP to accommodate sftp vice ftp**
16. ECR 812 - **Changes to VIP scripts for remote ftp**
17. ECR 809 - **Flag File for AWIPS During CRS B10.0 Installation**
18. ECR 816 - **Remove Extraneous and Misleading Message in MMI**

19. ECR 810 - **Messages With Duplicate Listening Area Codes Are Not Scheduled**

20. ECR 815 - **Include 9.0.1 Changes In Build 10.0**

21. ECR 813 - **CRS Will Only Look In /crs/data/CP/awips directory Upon Conclusion of FTP Session**

22. ECR 819 - **Change To Prevent Sets Of VIP Server Processes From Running**

23. ECR 820 - **Site Operator's Manual (SOM) Cleanup**

1.3 Strategy

The ST will be conducted at the WSH using a single test CRS with a VIP workstation. The ST will use:

a. Test messages sent by UNIX script files running on an AWIPS test simulator.

b. CRS test messages created by AWIPS message formatters [(Interactive Computer Worded Forecasts (ICWF) and the CRS AWIPS Formatter Extended (CAFE)] using the WSH test AWIPS [(the NWS Headquarters Modernization Test and Integration AWIPS, Weather Forecast Office (WFO) System (NMTW)].

c. NWR Specific Area Message Encoders (NWRSAME) decoders.

d. ROAMS Monitor Unit (MU) simulator.

e. English and Spanish text Weather Messages with CRS headers created manually. Both English and Spanish text messages will be sent to CRS either manually or new script files from AWIPS simulator via "sftp". The CRS forwards text messages to VIP for conversion to audio messages.

f. Externally generated voice messages.

The ST will be conducted in three different NWR CRS configurations:

a. Typical (1 transmitter)
b. Large (7 transmitters)
c. Maximum (13 transmitters).

A complete regression and build-specific test of all software capabilities and enhancements for a "maximum" configuration will be tested. A subset of the regression tests will be repeated to test the "typical" and "large" configurations.

The ST will focus on regression tests for the CRS and the VIP to ensure the VIP communication

interface to the CRS functions correctly for both English and Spanish texts.

Build-specific testing of ECRs will be performed in a formal manner. The build-specific testing will be performed using the same three configurations as regression testing. In addition, a subset of the regression tests will be repeated in a MP switch-over mode and the FEP switch-over-mode.

Once a successful ST is completed, the CRS B10.0/VIP B3.1 software will be deployed to operational field sites for an OAT as a prerequisite for national deployment.

1.4 Test Objectives

The ST will consist of regression testing and validation of NWS Engineering Modification Notes. The specific objectives of this ST are to:

a. Verify the NWS Installation Instructions for the installation of the new CRS B10.0/VIP B3.1 software are complete and accurate.

b. Verify, in a simulated environment, scheduled software fixes, changes, and enhancements were properly incorporated into the CRS and VIP, and they perform as specified in the CRS B10.0/VIP B3.1 Release Notes.

1.5 Test Result Analysis

Since no transmitters are used, speakers connected to the Audio Control Panel (ACP) unit and attached NWRSAME decoders will be used to analyze correct transmissions. Successful completion of the test procedure for each test case will be used as pass/fail criteria. If any abnormalities are observed, Test Trouble Reports (TTRs) will be written to document the problem and will be provided to the Test Review Group (TRG) for adjudication. The TRG will determine if the TTR warrants being submitted to the CRS Technical Representative for resolution. A copy of any unresolved Urgent TTRs will be provided to the OAT Team as known problems for which an exception may be required.

1.6 Test Review Group (TRG)

A ST Test Review Group (TRG) (see Table 1.0) will be established for the duration of the CRS Build 10.0 ST. The group will expeditiously coordinate issues and classify any problems identified during the ST. This group will review the ST activities, Test Trouble Reports (TTRs), and the final ST report. The TRG will also provide a recommendation to the VIP Program Manager and CRS Software Manager whether to proceed with the OAT.

The TRG will assist OPS23, the CRS Technical Representative in deficiency resolution. The TRG is a group of subject-matter experts and is chaired by the Chief, Test and Evaluation Branch (OPS24). The role of the TRG is to evaluate each TTR's impact on daily field service operations and make recommendations on TTR criticality.

During the ST the TRG Chair will convene the TRG periodically to:

a. Review, clarify and validate deficiencies documented in TTRs;
b. Categorize validated deficiencies to the CRS Technical Representative;
c. Coordinate the prioritization of validated deficiencies; and
d. Coordinate the resolution of other test-related issues.

Validated deficiencies will be categorized as follows:

a. Critical Deficiency - A repeatable problem that severely impacts NWR service operations; no work-around exists.

ACTION: Where possible testing will continue in other functional areas. The TRG may recommend suspension of the test to the CRS Technical Representative. If suspended, the test resumes when the CRS Technical Representative approves a proposed corrective action. When an approved corrective action is implemented, regression testing may be required.

b. Urgent Deficiency - A repeatable problem that severely impacts NWR service operations; however, a work-around exists.

ACTION: The test continues with the current system using a work-around until a permanent fix is available. Once the CRS Technical Representative approves the fix, only those test areas affected by the problem will be retested.

c. Routine Deficiency - A repeatable minor problem does not significantly impact NWR service operations.

ACTION: The test continues with the current system; approved work-arounds may be implemented. Routine deficiencies are submitted by the TRG to the CRS Technical Representative for adjudication.

d. Watch Item - A random or one-time, non-repeatable problem with potentially significant impact on NWR service operations.

ACTION: The TRG monitors test activities for recurrence of the problem; if recurrence is documented, the TRG considers re-categorizing the problem.

The TRG will be composed of the personnel identified in Table 1.

Table 1: CRS Test Review Group (TRG) Personnel

Name/Organization	Function	Phone
Jerald Dinges (OPS24)	Test Review Group Chair [Voting Member]	301-713-0326 x 160
Harry Tran (OPS24)	System Test Director	301-713-0326 x 105
Jae Lee (OPS24)	CRS Test Team	301-713-0326 x 158
Bert Viloria (OPS24)	CRS Test Team	301-713-0326 x 131
Joel Nathan (OPS23)	CRS Software Manager [Voting Member]	301-713-0191 x 119
Larry Lehmann (OST11)	VIP Program Manager [Voting Member]	301-713-3391 x 166
Jeff Earl (OPS12)	Maintenance Assurance	301-713-1833 x 162

Following completion of the ST, the TRG will convene to review the findings and recommend whether to proceed with the OAT.

1.7 Prerequisites, Assumptions, and Risks

This section describes the actions required before the ST; the availability of other equipment needed for the ST; and a description of risks associated with performing the ST at WSH.

1.7.1 Prerequisites

a. The OPS23 conducts and successfully completes a CRS B10.0/VIP B3.1 Integration Test.

b. A draft version of all CRS B10.0/VIP B3.1 documentation is available including Installation Instructions and Release Notes.

c. A Test Readiness Review is conducted and the system determined ready to begin the ST.

1.7.2 Assumptions

a. The AWIPS (NMTW) Test System is setup with the formatters listed in Section 1.7.3 and is connected to the test CRS/VIP suite.

b. The ROAMS MU simulator is connected to the test CRS/VIP and is operational.

c. NWRSAME encoders and decoders with audible alarm are available and ready for use by the ST team.

d. Text Weather Messages with CRS headers are manually created and sent to CRS by Unix script files or TransferNWR running on AWIPS test simulator.

e. External voice generated messages for use by the ST team.

1.7.3 Risks

a. A risk involved in the ST is the limited number of formatters and test capabilities which can be utilized due to hardware limitations of the WSH test systems. The test capabilities and formatters available at WSH consist of:

(1) Simulated test products - An AWIPS test simulator, located in the WSH facility at Silver Spring, Maryland, uses UNIX script files to send simulated (pre-recorded) messages to the WSH CRS.

(2). Text Weather Messages created manually with CRS headers. CRS operators need to find ways to “sftp” text Weather Messages to CRS (either manually or new script files). The CRS forwards text messages to VIP for conversion to audio messages.

(3) The AWIPS ICWF Product Formatter capability on the AWIPS test bed (NMTW) uses only the following products:

(a) Hourly Weather Roundup (HWR)
(b) Climate Report (CLI)
(b) State Area Forecast (SAF)
(c) Warning Generation Application Formatter (WARNGEN)
(d) Warning, Watch, Advisory (WWA)
(f) River Statement (RVS)
(g) Flash Flood Warning (FFW)
(h) Flood Stage Message Formatter (FLS)
(i) Flood Warning Message Formatter (FLW)

(4) The CAFE script application on the AWIPS tesbed (NMTW). [CAFÉ is a product formatter developed by the field and WSH].

b. No transmitters will be used to ensure adherence to the NWS policy against sending test warning products out to the public. A NWRSAME decoder (model MTR 4407) connected to the Audio Switch Module (ASM) will be used to monitor transmissions sent from the CRS in place of monitoring the output of a live transmitter, especially when using the NWRSAME tones. This is illustrated in Figure 1. The assumption is made the transmission line between the Audio Control Panel/Audio Switch Module (ACP/ASM) and the transmitter functions properly.

Another decoder (DCR-450) will be used to detect alarm generated per configured event code.

c. The new password security implementation between CRS and VIP could impact timely weather broadcast including “sftp vs. ftp” issues, proper aging of CRS passwords in accordance with DOC password policies, etc.

d. The CRS software is required to be modified with new capability to receive, process and broadcast the externally generated voice product which is a combination of the header file and voice file. Length of voice files might impact the interrupts on weather messages.

e. The “ssh/sftp protocols” will be used in VIP and CRS to receive/send files from/to MPs and pass status messages. Test messages may fail VIP conversion and default back to DECTalk in remote “ftp”.

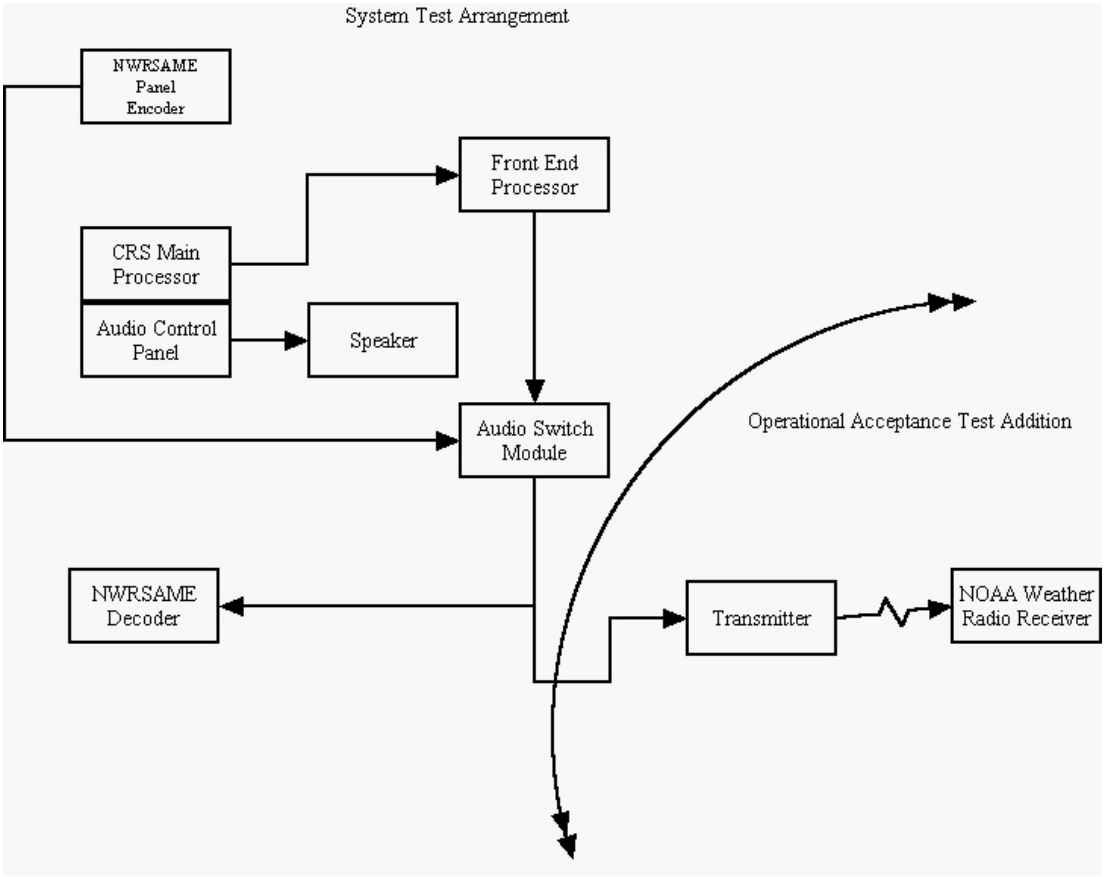

Figure 1: CRS-NWRSAME Panel Relationship

2.0 Method of Accomplishment

The following sections describe the test schedule, facilities, configuration, resources, and personnel roles and responsibilities used to conduct the ST.

2.1 Schedule

The ST will be conducted in accordance with the following schedule:

Table 2: Test Schedule

Dates		Action
Start	End	
4/10/04	5/27/04	Update ST Procedures
6/02/04	6/02/04	Finalize ST Plan
6/14/04	6/14/04	ST Readiness Review at WSH
6/14/04	8/05/04	Install CRS/VIP software and Conduct ST at WSH
8/05/04	8/05/04	ST Wrap up Meeting at WSH
8/09/04	8/09/04	Prepare ST Report

After completing the ST, the ST test report will be submitted by email.

2.2 Test Facilities

Only one site will be used for the ST, the WSH CRS Integrated Test Bed (ITB) at Silver Spring, Maryland. A description of the CRS system may be found in the CRS Site Operations Manual dated November 2001 (Note: Refer to figures 2, 3, and 4 in that document).

2.3 Test Methodology

The following sections provide a description of how the ST will be conducted. It will be the responsibility of the Test Director to ensure the test is performed as outlined. Any deviation from the test methodology will be documented in the ST report. If there are any changes to the ST procedures, the changes will be provided to the ST testers prior to conduct of the affected tests.

2.3.1 Pre-ST Activities

Prior to ST conduct, OPS23 will complete these actions:

a. Conduct a successful CRS B10.0/VIP B3.1 integration test; and

b. Develop the draft CRS B10.0/VIP B3.1 delivery package consisting of the following items:

    1) Copy of the e-mail to the CRS Regional Focal Points describing the purpose and content of the delivery package

    2) CRS B10.0/VIP B3.1 Release Notes

    3) CRS B10.0/VIP B3.1 Installation CD - The CRS/VIP software installation will be performed following the CRS/VIP Software Installation Instructions using the CD media.

    4) CRS B10.0/VIP B3.1 Software Installation Instructions

c. OPS13 will generate the necessary Engineering Management Reporting System (EMRS) instructions based on the Request for Change (RC) number assigned.

d. OPS23 will provide with a signed CRS certification (Attachment D).

e. OPS24 will develop the ST Plan and Procedures.

2.3.2 Test Cases

Regression and build specific test cases were developed for the tests identified in Attachment A-CRS B10.0/VIP B3.1 System Tests Case Description. Detailed procedures for each test case are found in System Test Procedures for the Console Replacement System (CRS).

2.3.3 Test Configuration and Resources

The following sections describe the WSH CRS test configuration, supporting documentation, and test personnel roles and responsibilities.

2.3.3.1 Hardware/Software

A fully configured, 13-transmitter CRS complete with a VIP workstation located in the WSH ITB will be used during the test session.

An AWIPS simulator will be used to send test messages to the CRS.

A WSH AWIPS test system (NMTW) will be used to send AWIPS-formatted test messages to the

CRS.

A ROAMS MU simulator will be used to test the CRS ROAMS MU interface.

NWRSAME encoders and decoders (model MTR 4407 and DCR-450)) will be used to test specific area message encoding.

A transmitter simulator will be used to verify the audio output of the system. The transmitter simulator will consist of an amplified speaker connected to the CRS ACP audio output jack to monitor the various products.

The CRS B10.0/VIP B3.1 software will be configured in accordance with the ST test schedule in Table 2 and then tested in accordance with the procedures identified in this document. Table 3 contains the CRS component versions used in the test configuration; Table 4 contains the VIP component versions used in the test configuration.

Table 3: CRS Component Versions at WSH

Component	Version Number
CRS Application Software	9.9.x
DECtalk Firmware	4.50.03 B003
ACP Firmware	80305X1
SCO UNIXWare	2.03 (on Front End Processor) 7.1.1 (on Main Processor)
ASC Firmware	BFD4
ROAMS MU Simulator PROM	2.3
ClearCase Software	3.2.1
AWIPS	OB4

Table 4: VIP Component Versions at WSH

Component	Version
Dell Plus Workstation	4829
Linux Operating System	Red Hat 7.3 (on VIP system)
Tcl Compiler	8.0
VIP software	3.0.5

Speechify	2.1.5

2.3.3.2 Support Documentation

CRS support documentation hardware/software installation and operational instructions will be used in the ST. Reference to these documents will be made as required throughout the test. The list of documentation and procedures includes, but is not limited to, the following:

- System Test Plan for the CRS B10.0/VIP B3.1
- System Test Procedures for the CRS B10.0/VIP B3.1
- CRS B10.0/VIP B3.1 Installation Instructions (draft)
- CRS B10.0/VIP B3.1 Release Notes (draft)
- Updated CRS Site Operator's Manual (SOM).

2.3.3.3 Test Personnel and Responsibilities

The WSH personnel participating in the ST are listed in Table 5.

Table 5: Test Personnel

Name/Organization	Function	Phone	E-mail
Harry Tran (OPS24)	CRS Test Director	301-713-0326 x105	harry.tran@noaa.gov
Sung Vo (OPS23)	CRS Software Support	301-713-0191	sung.vo@noaa.gov
Jae Lee (OPS24)	CRS Test Team	301-713-0326 x 158	Jae.lee@noaa.gov
Bert Viloria (OPS24)	CRS Test Team	301-713-0326 x 131	bert.viloria@noaa.gov
Joel Nathan (OPS23)	CRS Software Support	301-713-0191 x119	joel.nathan@noaa.gov
Larry Lehmann (OST11)	VIP Program Support	301-713-3391 x166	lawrence.lehmann@noaa.gov
Warrick Moran (OPS23)	CRS Software Support	301-713-0191 x 193	warrick.moran@noaa.gov

Table 5: Test Personnel			
Name/Organization	**Function**	**Phone**	**E-mail**
Nancy Helderman (OPS23)	CRS Software Support	301-713-0191 x 139	nancy.helderman@noaa.gov
Mark McInerney (OST23)	VIP Software Support	301-713-0056 x185	mark.mcinerney@noaa.gov
David Glotfelty (OPS23)	CRS Software Support	301-713-0191 x 215	david.glotfelty@noaa.gov

The following describes the major roles and responsibilities of the test personnel:

Test Director, OPS24 - Ensures all tests defined for the ST are completed and the results properly documented in the ST report. Responsible for collecting and presenting all test trouble reports to the TRG for classification. Following completion of the ST, the Test Director will call a final meeting for the TRG, detail what was tested, report to the VIP PM and CRS Software Manager the ST conclusions, and recommend whether to proceed with the OAT. Ensures all test trouble reports documented and classified during the ST are forwarded to the proper WSH organization or board for adjudication; writes the ST report to document the test results and recommendations. The Test Director also serves as a member of the test team.

Test Team, OPS24 and OPS23 - Responsible for performing individual test procedures as assigned; documents the results of each test in test logs; completes test trouble report forms when problems/discrepancies are observed; provides the Test Director with all completed forms. Informs the Test Director with comprehensive technical information on how the tests were conducted and any problems encountered. For interface testing, the test team member is responsible for the setup of the various communication interfaces.

CRS Software Support, **CRS Technical Representative** - Responsible for providing technical support and information as required when CRS questions arise; schedules investigation and solution of CRS discrepancies.

Engineering Support, OS13 - Responsible for generating the necessary EMRS instructions based on the RC number assigned.

2.3.4 Installation

At the start of the ST, the Test Team will install the CRS B10.0/VIP B3.1 software in accordance with the Installation Instructions. The instructions will be evaluated and comments will be forwarded to the Test Director, CRS Technical Representative, and the Engineering Support.

2.3.5 Test Conduct

Prior to ST commencement, OPS23 must successfully conduct a CRS B10.0/VIP B3.1 integration

test. In accordance with the schedule contained in Table 2, on the first day of the ST, the Test Director will conduct a ST readiness review with the TRG to ensure all the prerequisites are in place before ST can be started. During this review, the CRS Technical Representative will deliver the hardware/software suite to OPS24 for the ST. The Test Director will also present the details of what will be tested during the ST, how the ST will be conducted, and how discrepancies will be handled.

The ST will be conducted by performing Regression and Build-specific Testing.
Regression testing will consist of performing those tests deemed sufficient to verify Build 9.0 functionality remains in Build 10.0. In addition regression testing will be used to verify the corrected discrepancies have been incorporated and do not contribute additional problems.

Attachment A itemizes the regression and build-specific tests that will be performed during the ST.

Test cases will be performed using a maximum number of transmitters (thirteen transmitters) and the latest version of the CAFÉ, as appropriate. A subset of the specified tests will be preformed using a typical (1) and large (5) transmitter configuration.

CRS Build-specific testing, Test# 004, will consist of tests required to verify the new enhancements and bug fixes of Build 10.0. Refer to Attachment B for test conduct sequence.

In addition, following successful completion of the test cases, the MP and FEP will be switched to a back-up mode and a subset of the test cases repeated.

Any abnormalities or indications of non-compliant functional operations observed during the ST will be logged and called to the immediate attention of the ST Director. The Test Director will present the discrepancies to the TRG for adjudication. The Test Director will forward all discrepancies to the VIP Program Manager or CRS Technical Representative for resolution. A copy of any discrepancies still pending at the conclusion of the ST will be provided to the OAT Director as “Known Problems.”

A test sequence checklist (Attachment B) will be maintained for each test case.

2.3.6 Post-ST Activities

Following completion of the ST, the ST Test Director will conduct a final meeting for the TRG detailing what was tested, a summary of any discrepancies found, major findings, and recommendations. The TRG will review the materials presented by the Test Director and make a recommendation to the CRS Technical Representative and the VIP Program Manager whether to proceed with the OAT. After the final meeting, the Test Director will prepare a report of all test activities, including details of any deficiencies. The report will also include findings and final recommendations. A copy of all outstanding deficiencies will be provided to the OAT Test Team and the TRG.

3.0 Test Recommendations and Report

At the conclusion of the ST, the TRG will review any problems documented during the final week of the ST. If no critical deficiencies remain, and work-arounds developed and documented for urgent deficiencies that cannot be fixed until a future build, a recommendation to proceed with the OAT will be forwarded to OPS23, the CRS Technical Representative. A formal ST report will be written after the completion of the ST.

Attachments

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Attachment A

CRS B10.0/VIP B3.1 Test Case Description

Test	Title	Purpose	CRS Formatter Exercised
000	CRS B10.0/VIP Installation	The objective of this test is to verify CRS B10.0 can be installed over CRS 9.0/VIP 3.0, the software builds currently at sites.	Simulator
001	Spanish Messages Setup, Input and Verification	The objective of this test is to verify the set up Spanish Capability, transmitter configuration, Message component, and Message Types setups, Spanish Trailers with AWIPS warning messages.	Simulator
002	CRS/VIP Setup	The objective of this test procedure is to examine the various VIP setup including the VIP dictionaries capability and VIP Activities Logs.	Simulator
004	CRS Build Specific	The objective of this test is to verify the fixes to the CRS ECRs were incorporated into the CRS 10.0 build.	Simulator
100	UNIX Services	The objective of this test is to examine the various UNIX printer services. Print jobs may be queued to the line printer (and subsequently controlled) from the command line or with an included Print Monitor.	Simulator
101	System Utilities Check	The objective of this test is to verify that the system utilities including the CRS Log Viewer, Help displays, Dictionary processing, and Data Verify functions are operational.	Simulator
102	System Logging	The objective of this test is to verify proper operation of the CRS Activity Logs, Error Logs, and the logs' Graphical User Interface (GUI).	Simulator
103	CRS Tones	The purpose of these test procedures is to test specific CRS tone (transfer, NWRSAME, etc.) functions.	Simulator

Test	Title	Purpose	CRS Formatter Exercised
104	OffLine CRS Utilities	The purpose of these test procedures is to test the Offline CRS Utilities including the Audio Control Panel (ACP) diagnostics, CRS Log Viewer, XCRS_SITE Create ASCII File, XDBBuild.	Simulator
105	GUI-Transmitter Configure	The purpose of these test procedures is to test the Transmitter Configure window GUI and control/request processing. The test will include: - long pause, general transmitter data save. - Amplitudes and voice parameters update and reset save.	Simulator
106	GUI-Disable Silence	The purpose of these test procedures is to test the Disable Silence Alarm window GUI and control/request processing. The test will include: - disabling and re-enabling of selected silence alarms per selected transmitter(s).	Simulator
107	GUI-System Reports	The purpose of these test procedures is to test the System Reports window GUI and reports processing. The test will include: - running reports request/response processing - printing reports returned from initial display request	Simulator
108	GUI-Pronunciation Dictionary	The purpose of these test procedures is to test the Pronunciation Dictionary window GUI and reports processing. The test will include creating, editing, configuring, and copying pronunciation dictionaries.	Simulator
201	Message Input and Verification	The objective of this test is to verify CRS input messages from various sources (AWIPS, or on a diskette) using various AWIPS message formatters. Any vulgar words detected are corrected before the message is converted to speech. Direct voice message input to CRS will be verified as well. Proper functioning of seven and eight character message types and transmitters with a large number of Listening Area Codes (LACs) are also verified.	Simulator

Test	Title	Purpose	CRS Formatter Exercised
202	Interrupt Messages	The objective of this test is to verify message interruption, emergency override and alert tone processing..	Simulator
203	Message Reference Descriptor (MRD)	The object of this test is to exercise the Replace and Follow functionality using MRD. Proper operation of the Identical Message Replacement (IMR) is also tested.	Simulator
204	Lead-in Associations/ Modifiers/CTA /Time Interval	The objective of this test is to verify the operation of the Lead-in, Call To Action (CTA), and periodic message time interval capabilities.	Simulator
205	Message Components	The objective of this test is to verify operation of the Lead-in, interrupt announcements, CTA, and time announcements capabilities.	Simulator
206	AWIPS Formatters	The objective of this test is to verify the AWIPS and product formatters (ICWF, WWA, WARNGEN, and RiverPro) can send their respective products (HWR, CLI, SAF, WWA,RVS, FLS, and FLW) to the CRS for transmission. The CRS capability to perform a time-synch to AWIPS is tested as well as the CAFÉ product formatter, and that FTP connects/disconnects are no longer shown.	Simulator
301	ROAMS	The objective of this test is to verify ROAMS Query and Alarms reporting capabilities.	Simulator
303	Emergency Override (EO)	The objective of this test is to verify the EO capability of CRS functions properly and that emergency voice messages are recorded for immediate transmission scheduling of live EO following special EO broadcasts. A NWRSAME decoder will be used to validate NWRSAME tones.	Simulator
304	Synthetic Speech Override (SSO)	The objective of this test is to verify the operator can either digitize or synthesize ingested emergency messages for immediate transmission by the CRS.	Simulator
401	MP Switch Backup Configuration	The objective of this test is to verify the switch over of a MP to the backup Shadow Processor and the VIP works after the switch over.	Simulator

Test	Title	Purpose	CRS Formatter Exercised
402	FEP Switch Backup Configuration	The objective of this test is to verify failure of a FEP causes an automatic switch to the backup FEP and the VIP continues to function after the switch. A manual FEP switch will also be tested.	Simulator
403	Backup Live	The objective of this test is to verify CRS' capability to send out emergency warnings by means of the Backup Live function even if the CRS MPs and FEPs fail. A NWRSAME decoder will be used to validate NWRSAME tones.	Simulator
500	Voice Improvement Processor (VIP)	The objective of this test is to verify operation of the Voice Improvement Processor capabilities. The stability of the CRS is tested by ensuring VIP messages returned to the CRS do not cause core dumps. Also, failure of the VIP results in automatic reactivation of the existing DECTalk synthetic speech capability.	Simulator
501	VIP Configuration & Function	This test procedure will verify current VIP configuration and functionalities.	Simulator
502	VIP Dictionary/ Pronunciation Evaluation	The objective of this test is to verify the VIP Spanish and English dictionaries functionality and capability. Also, testing the quality of pronunciation.	Simulator
601	Database Backup	The objective of this test is to verify the CRS database can be backed-up and restored by specifying a sub-directory name.	Simulator
602	Dictionary Backup	The objective of this test is to verify the CRS Dictionaries can be backed-up and restored manually.	Simulator
800	CRS/VIP System Stability	The objective of this test is to verify the CRS/VIP can process multiple messages (simulating an operational environment) for 72 hours with without a system crash.	Simulator

Attachment B

CRS B10.0/VIP B3.1 System Test Sequence Checklist

Test	Title	CRS Database on OMP and 5MP /crs_test/	Test Messages on AWIPS Simulator /home/crs/testdata/	Date	P/F
000	CRS 10.0/VIP 3.0 Installation	ST_013.ASC (MAX) ST_007.ASC (LRG) ST_001.ASC (TYP)	N/A		
004	CRS Build 10.0 Specific	ST_013.ASC (MAX) ST_007.ASC (LRG) ST_001.ASC (TYP	../Preload/ directory: GEN_1.AW to GEN_8.AW - External Voice Messages - 004_BVV.AW		
100	UNIX Services				
101	System Utilities Check	/crs_test/TST_101.ASC	../Preload/ directory: GEN_1.AW to GEN_8.AW		
102	System Logging	ST_013.ASC (MAX) ST_007.ASC (LRG)	../Preload/ directory: GEN_1.AW to GEN_8.AW ../Preload/Tst_102/ directory: - m1_1.AW - m1_3.AW - m1_4.AW		
104	Offline CRS Utilities	ST_013.ASC (MAX) ST_007.ASC (LRG) ST_001.ASC (TYP) /crs/data/SS/TST_101_PLUS.ASC	../Preload/ directory: GEN_1.AW to GEN_8.AW.		

Test	Title	CRS Database on OMP and 5MP /crs_test/	Test Messages on AWIPS Simulator /home/crs/testdata/	Date	P/F
105	GUI - Transmitter Configure		../Preload/ directory: **GEN_1.AW** to **GEN_8.AW**		
106	GUI-Disable Silence				
107	GUI-System Report				
108	GUI- Pronunciation Dictionary				
001	Spanish Message Input and Verification	**ST_013.ASC** **ST_001.ASC**	../SSO/directory: **HLSGEN.AW** **TORGEN.AW** **LSRGEN.AW** **SMWGEN.AW** Spanish Text Message: **SPA_TOR.AW**		
002	CRS/VIP Setup				

Test	Title	CRS Database on OMP and 5MP /crs_test/	Test Messages on AWIPS Simulator /home/crs/testdata/	Date	P/F
500	Voice Improvement Processor	ST_013.ASC (MAX) ST_007.ASC (LRG)	../Preload/VIP/ directory: - Generic VIP_to Alpha ../Preload directory: - CCCHWRXXX.AW ../Preload/Tst_500/ directory: - 206_LFPGEN.AW - 206_geo-tel.AW 206_INTERRUPT_ACT_MESSAGE_FOR_DECT.AW 206_INTERRUPT_ACT_MESSAGE_FOR_VIP3.AW ../Preload/ Tst_500/ 206_NO_INTERRUPT_ACT_MESSAGE_FOR_D.AW 206_NO_INTERRUPT_ACT_MESSAGE_FOR_V.AW ../Preload/ directory: - MSG_500.AW - MSG_1000.AW - MSG_1500.AW		
501	VIP Configuration & Functions				
502	VIP Dictionary & Word Pronunciation Evaluation	TST_502.ASC (MAX) TST_502L.ASC (LRG) TST_502T.ASC (TYP)			

Test	Title	CRS Database on OMP and 5MP /crs_test/	Test Messages on AWIPS Simulator /home/crs/testdata/	Date	P/F
201	Message Input and Verification	ST_013.ASC (MAX) ST_007.ASC (LRG) ST_001.ASC (TYP)	../Preload/Tst_201/ directory: 201_CAC100_700.AW 201_CLM_CAC100_250.AW 201_PNS_CAZ100_700.AW ../VIP/ directory: Gen_1.AW to Gen_8.AW ../Preload/ directory: GenLong1.AW to GenLong8.AW ../Preload/Tst_201/ directory: - ZERO_BYTE.AW .. /SVR/ directory: - LAXSVRGEN.AW		

Test	Title	CRS Database on OMP and 5MP /crs_test/	Test Messages on AWIPS Simulator /home/crs/testdata/	Date	P/F
202	Interrupt Messages	/crs_test/TST_202.ASC	../VIP/ directory: **Gen_1.AW** to **Gen_8.AW** ../Preload/Tst_202/ directory: **- m2_1.AW, LAXHLSGEN** **- m3_1.AW, LAXLFPGEN** - **m4_1.AW**, **LAXNOWGEN** - **m5_1.AW, LAXNOWGEN** - **m6_1.AW**, **LAXSCSGEN** - **m7_1.AW**, **LAXFFSGEN** - **202_TOR.AW**		

Test	Title	CRS Database on OMP and 5MP /crs_test/	Test Messages on AWIPS Simulator /home/crs/testdata/	Date	P/F
203	**Message Reference Descriptor (MRD)**	**TST_203.ASC** **ST_013.ASC**	../Preload/ directory: **GEN_1.AW** to **GEN_8.AW** ../Preload/TST_203/ directory: **- 4112-1_1.AW** through **4112-1_9.AW** and **4112-1_a.AW** - **msg_ffs1.AW** - **msg_svr1.AW** - **msg_ffw1.AW** - **msg_svs1.AW** - **msg_ffs2.AW** - **msg_ffs3.AW** - **msg_svr2.AW** - **msg_ffw2.AW** - **msg_svs2.AW** - **msg_sls2.AW**		

Test	Title	CRS Database on OMP and 5MP /crs_test/	Test Messages on AWIPS Simulator /home/crs/testdata/	Date	P/F
204	Lead-In, CTA, Time Interval	TST_204.ASC	../Preload/TST_204/ directory: - 4113-2*.AW - M3-1.AW (AFOSID003) - M4-1.AW (AFOSID004) - M5-1.AW (AFOSID005) - M6-1.AW (AFOSID006) - M24-2.AW - M7-1.AW (AFOSID007) - M30-1.AW - M31-1.AW		
205	Message Components		./Preload/ directory: GEN_1.AW to GEN_8.AW		
206	AWIPS Formatters	ST_013.ASC	../Preload/ directory: - CCCHWRXXX		
301	ROAMS	ST_013.ASC (MAX) ST_007.ASC (LRG) ST_001.ASC (TYP)	../Preload/ directory: GEN_1.AW to GEN_8.AW		
303	Emergency Override (EO)				

Test	Title	CRS Database on OMP and 5MP /crs_test/	Test Messages on AWIPS Simulator /home/crs/testdata/	Date	P/F
304	Synthetic Speech Override (SSO)	ST_013.ASC (MAX) ST_007.ASC (LRG) ST_001.ASC (TYP)	../Preload/SSO directory: - SSO message with SAME tones. LAXHLSGEN LAXTORGEN LAXSVRGEN LAXLSRGEN LAXSMWGEN LAXHLSGEN		
601	Database Backup	TST_502.ASC			
602	Dictionary Backup	ST_013.ASC (MAX)	../Preload/ directory: GEN_1.AW to GEN_8.AW		
401	MP Switch Backup	ST_013.ASC (MAX) ST_007.ASC (LRG) ST_001.ASC (TYP)	../Preload/ directory: GEN_1.AW to GEN_8.AW		
402	FEP Switch Backup	ST_013.ASC (MAX) ST_007.ASC (LRG) ST_001.ASC (TYP)	../Preload/ directory: GEN_1.AW to GEN_8.AW		
403	Backup Live				
800	CRS/VIP System Stability				

Attachment C

CRS B10.0/VIP B3.1 Release Notes

1. Include additional configuration or add on logon code used open source routines to check for password DOC compliance with respect to number and kind of character and password aging, etc. ECR 805

1.1 UnixWare password revision and any SDM login manager change.

1.2 VIP update OS in the linux-PAM configuration for closest match in passwd.

2. Eliminate the uses of clear text “ftp” logins between AWIPS and CRS and between CRS and VIP. ECR 804. This also requires an AWIPS change, which is being coordinated with OS&T.

2.1 Analysis of openssl and openssh encryption packages to determine and remove non-open standards, configure, and confirm system still works with Redhat 7.2/7.3 ssh. Configure and rebuild prototype. Bring initial “ssl/ssh” build under Clearcase. Test basis “sftp” functionality. Investigate lack of int 64 support.

2.2 Redo the AWIPS simulator data feed system from RedHat Linux 7.l2 to Redhat Linux 9.0 for AWIPS compatibility. Implement “ftp” and “sftp” filetransfer Patch secure, etc.

2.3 Development of host based authentication setup for AWIPS simulator, CRS, and VIP. Integration testing between the systems.

2.4 Development of encryption key/ssh/ssl installation scripts and procedures for CRS/VIP.

2.5 Installation under ClearCase CM system.

2.6 Security update to “ssl” necessary to eliminate denial of service vulnerability.

3. ECR 786 - This will correct the problem with VIP/manual recording collision, EO Streamcopy failure, and force cp_vc time out and restart CRS so it won’t keep waiting for cp_di to respond.

4. ECR 785 - CommPower’s SNQM additional keys and changes.

5. ECR 214 - Support for externally generated voice products.

6. ECR 209 - Date/Time or AWIPS time request updates stop/start cp_vc. This is to be expected because cp_ai must be restarted to get new time to compare with time in an incoming message. The solution is to add the display of an Information Dialog when the operator initiates a time change request. The message will be the following: **Update time will restart VIP interface and stop/start cp_vc**. The operator will be given the opportunity to continue with the command or cancel it.

7. ECR 213 - Multiple future effective time watch/warning interrupts are not scheduled. The problem occurs when a watch/warning message with a future effective is received by CRS. Before this message is broadcast, a replacement for it is received with a future effective time. The first message should permanently replaced by the second, but neither of them are scheduled when their respective effective times are reached. The software will be modified to schedule the second future effective time message when its effective time reached and the first message becomes inactive.

8. ECR 216 - The CRS/ROAMS interface software in CRS does not recognize the bit that is used to define local 10-digit dialing. Therefore, if you do a Query to a ROAMS that is set for local 10-digit dialing, it will display a garbled telephone number.

9. ECR 215 - The font used in the MMI display is too small. The font size is helvetica 7 and will be changed to helvitica 10.

10. ECR 799 - Add Special DMO Test NWRSAME Capability - CRS will be modified to check for special Event Code “DMO”. If found, CRS will ignore the normal NWRSAME generation of UGC codes based on the LACs in the message header. Instead, CRS will generate a single code of “999999". This special code provides the NWS field offices a means of conducting exercises to proactive issuing authentic warnings and other critical messages without disrupting the EAS network or turning on receiver codes used by industry and the general public. The event code “DMO” should not normally be programmed into the receiver decoder, and the location code of “999999" does not match any existing or future geographical area codes. It may also be used as a maintenance aid to align and test the communications link.

11. ECR 803 - Off Line Tone Generator Failure to Write Configuration to Disk.

12. ECR 806 - Three VIP OS (Red Hat 7.3) Security Patches that were detected with the 12/03 security scan plus whatever other security patches that have been generated by Red Hat since.

13. ECR 807 - VIP changes for Mondo image system.

14. ECR 811 - VIP “sftp” changes to “ftp” scripts - this includes “ftp” to CRS MPs.

15. ECR 808 - CP_VC changes in MP to accommodate “sftp” vice “ftp”. This affects ftp.ksh and the install script where user is prompted to enter crs user password and distributed to other processors via chg emb_pw.ksh.

16. ECR 812 -. Changes to VIP scripts for remote “ftp”:1) VIPserver process does not finish conversion before ftp put called in remote “ftp” of MP3 files and 2) pre-defined length of the remote “ftp” string (remote username:hostname:password) needs to be more than 23 characters.

17. ECR 809 - Need a flag file during the CRS Build 10.0 install that is sent to AWIPS to let it know that CRS has ssh installed, so AWIPS can start sending messages to CRS via “sftp” vice “ftp”.

18. ECR 816 - Remove most extraneous and misleading messages in MMI.

19. ECR 810 - Messages with duplicate listening area codes are not scheduled. The problem is identical “Message Area Table” entries are invalid because of their matching filenames. This occurs because of the duplicate listening area codes. A function will be written to perform a duplicate check.

20. ECR 815 - Include 9.0.1 changes in Build 10.0.

21. ECR 813 - CRS will only look in /crs/data/CP/awips directory upon conclusion of “ftp” session. With replacement of “ftp” with “sftp”, need to define similar “sftp” wrapper.

22. ECR 819 - If VIP GUI is not functioning correctly, operator may restart. GUI shows that VIPserver is stopped, but, in fact, it is up and depicted as so on CRS with VIP status indicator. Operator may “restart” VIPserver, which will actually cause an additional set of VIPserver processes to start. This could result in corrupted wave files going back to CRS. Change will prevent multiple sets of VIPserver processes from running.

23. ECR 820 - SOM cleanup (Off Line Tones changes to make sure Transmitter Configuration window is closed before starting the Off Line Tone window and XCRS_Site changes to add Create ASCII button).

Attachment D

CERTIFICATION FOR CRS B10.0/VIP B3.1 SYSTEM TEST

The purpose of this "check-out sheet" is to document that the various CRS hardware and software are functioning, and all required documentation is available to support CRS Build 10.0/VIP Build 3.1 System Test (ST). **The ST is scheduled to begin 06/14/04**. The items below are required to be completed by **06/11/04**.

Entries should be made below to identify hardware serial number(s), firmware versions, etc. required to identify the equipment configuration to be tested. COTRs and their Branch Chiefs need to certify that the subsystems have been checked out and ready for ST. The CRS Program Leader will certify that the System is ready to be turned over to Harry Tran (System Test Director).

1.01 Hardware: Joel Nathan (OPS23) _____ Date: _____

CRS 0MP Hardware S/N: _____ OS Version: _____

ACP 1 Hardware S/N: _____ Firmware Ver: _____

CRS 5MP Hardware S/N: _____ OS Version: _____

ACP 2 Hardware S/N: _____ Firmware Ver: _____

CRS 1FEP Hardware S/N: _____ OS Version: _____

CRS 2FEP Hardware S/N: _____ OS Version: _____

CRS 3FEP Hardware S/N: _____ OS Version: _____

CRS 4BKUP Hardware S/N: _____ OS Version: _____

CRS Printer S/N: _____

CRS ROAMS Modem S/N: _____

CRS ROAMS MU Simulator S/N: _____

CRS NWRSAME Encoder S/N: _____

CRS NWRSAME Decoder 4407 S/N: _____

CRS NWRSAME Decoder DCR-450 S/N: _____

VIP Processor S/N: _____ OS Version: _____

AWIPS Simulator Hardware S/N: _____ OS Version: _____

2.0 Software: Joel Nathan (OPS23) _____ Date: _____

Application software, CRS Version: _____
Application software, VIP Version: _____
Mondo Disk Imaging software Version: _____

3.0 Documentation

CRS Build 10.0/VIP 3.1 Engineering Mod Notes/Installation Instructions
OPS12: Jeff Earl: _____ Date: _____
OPS12: Al Wissman: _____ Date: _____

CRS Build 10.0/VIP 3.1 Release Notes
Updated CRS Site Operator's Manual
Updated CRS System Administrator Manual
OPS23: Joel Nathan: _____ Date: _____

4.0 CRS Test Systems ready for ST

OPS23: Richard Thomas: _____ Date: _____